

IN THE CLAIMS:

Claim 11 has been amended herein. All of the pending claims 1 through 60 are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

1. (Previously presented) A method for identifying a type of semiconductor device being fabricated on a substrate by evaluating an identification mark comprising at least one recess in the substrate surface through at least one layer formed over the mark, comprising: scanning electromagnetic radiation of at least one wavelength across at least a portion of the substrate including the at least one recess, the at least one wavelength at least partially penetrating at least one layer of a material opaque to visible wavelengths of electromagnetic radiation to an identifying mark embedded within materials that are opaque to visible wavelengths of electromagnetic radiation; measuring an intensity of radiation of the at least one wavelength reflected by different locations of the at least a portion of the substrate; detecting locations at which the intensity changes from substantially a baseline intensity; and correlating each location at which the intensity changes from substantially the baseline intensity to at least one characteristic which distinguishes characters of the identification mark from other features on or in the substrate to reveal the identification mark and to identify the type of semiconductor device being fabricated on the substrate.
2. (Previously presented) The method of claim 1, wherein scanning comprises raster scanning the electromagnetic radiation.
3. (Previously presented) The method of claim 1, wherein scanning is effected over at least a portion of a wafer comprising semiconductor material where the identification mark is located.

4. (Previously presented) The method of claim 1, wherein scanning comprises scanning electromagnetic radiation comprising a plurality of wavelengths across at least the portion of the substrate.
5. (Previously presented) The method of claim 4, wherein measuring comprises measuring intensities of reflected radiation of each of the plurality of wavelengths.
6. (Previously presented) The method of claim 1, wherein scanning comprises scanning electromagnetic radiation of wavelengths of about 100 nm to about 1,000 nm across the at least a portion of the substrate.
7. (Previously presented) The method of claim 1, wherein scanning comprises scanning electromagnetic radiation of wavelengths of about 190 nm to about 800 nm across the at least a portion of the substrate.
8. (Previously presented) The method of claim 1, wherein scanning comprises scanning electromagnetic radiation of a wavelength of at least about 140 nm across the at least a portion of the substrate.
9. (Previously presented) The method of claim 1, wherein scanning comprises scanning electromagnetic radiation of wavelengths of about 220 nm to about 800 nm across the at least a portion of the substrate.
10. (Previously presented) The method of claim 1, wherein scanning comprises scanning electromagnetic radiation of wavelengths of about 300 nm to about 780 nm across the at least a portion of the substrate.

11. (Currently amended) The method of claim 1, wherein scanning comprises scanning electromagnetic radiation of ~~a wavelengths~~ wavelength of about 550 nm across at the least a portion of the substrate.

12. (Previously presented) The method of claim 1, wherein scanning is effected from above the substrate.

13. (Previously presented) The method of claim 1, wherein scanning is effected at a non-perpendicular angle relative to the substrate.

14. (Previously presented) The method of claim 1, wherein scanning comprises moving a source of the electromagnetic radiation relative to the substrate.

15. (Previously presented) The method of claim 1, wherein scanning comprises moving the substrate relative to a source of the electromagnetic radiation.

16. (Previously presented) The method of claim 1, wherein measuring the intensity is effected using a reflectometer.

17. (Previously presented) The method of claim 1, wherein detecting comprises identifying a location of the substrate from which the electromagnetic radiation was reflected.

18. (Previously presented) The method of claim 1, wherein detecting comprises identifying a location of the substrate to which the electromagnetic radiation was directed.

19. (Previously presented) The method of claim 1, wherein correlating comprises mapping at least each location at which the intensity of electromagnetic radiation reflected from the substrate varied from the baseline intensity.

20. (Previously presented) The method of claim 19, wherein correlating further comprises recognizing the identification mark based at least in part on mapping.

21. (Previously presented) A method for determining a destination for a semiconductor device substrate, comprising:
identifying an identification mark comprising at least one recess defining a character within a surface of the semiconductor device substrate and embedded material opaque to visible wavelengths of electromagnetic radiation by:
scanning electromagnetic radiation of at least one wavelength across at least a portion of the semiconductor device substrate including the at least one recess, the at least one wavelength capable of at least partially penetrating the material;
measuring an intensity of radiation of the at least one wavelength reflected by different locations of the at least a portion of the semiconductor device substrate;
detecting locations at which the intensity changes from substantially a baseline intensity;
and
correlating each location at which the intensity changes to identify the mark; and
identifying a predetermined destination for the semiconductor device substrate based on the identification mark.

22. (Previously presented) The method of claim 21, wherein scanning comprises raster scanning the electromagnetic radiation.

23. (Previously presented) The method of claim 21, wherein scanning is effected over at least a portion of the semiconductor device substrate comprising semiconductor material where the identification mark is located.

24. (Previously presented) The method of claim 21, wherein scanning comprises scanning electromagnetic radiation comprising a plurality of wavelengths across at least the portion of the semiconductor device substrate.

25. (Previously presented) The method of claim 24, wherein measuring comprises measuring intensities of reflected radiation of each of the plurality of wavelengths.

26. (Previously presented) The method of claim 21, wherein scanning comprises scanning electromagnetic radiation of wavelengths of about 100 nm to about 1,000 nm across the at least a portion of the semiconductor device substrate.

27. (Previously presented) The method of claim 21, wherein scanning comprises scanning electromagnetic radiation of wavelengths of about 190 nm to about 800 nm across the at least a portion of the semiconductor device substrate.

28. (Previously presented) The method of claim 21, wherein scanning comprises scanning electromagnetic radiation of a wavelength of at least about 140 nm across the at least a portion of the semiconductor device substrate.

29. (Previously presented) The method of claim 21, wherein scanning comprises scanning electromagnetic radiation of wavelengths of about 220 nm to about 800 nm across the at least a portion of the semiconductor device substrate.

30. (Previously presented) The method of claim 21, wherein scanning comprises scanning electromagnetic radiation of wavelengths of about 300 nm to about 780 nm across the at least a portion of the semiconductor device substrate.

31. (Previously presented) The method of claim 21, wherein scanning comprises scanning electromagnetic radiation of a wavelength of about 550 nm across the at least a portion of the semiconductor device substrate.

32. (Previously presented) The method of claim 21, wherein scanning is effected from above the semiconductor device substrate.

33. (Previously presented) The method of claim 21, wherein scanning is effected at a non-perpendicular angle relative to the semiconductor device substrate.

34. (Previously presented) The method of claim 21, wherein scanning comprises moving a source of the electromagnetic radiation relative to the semiconductor device substrate.

35. (Previously presented) The method of claim 21, wherein scanning comprises moving the semiconductor device substrate relative to a source of the electromagnetic radiation.

36. (Previously presented) The method of claim 21, wherein measuring the intensity is effected using a reflectometer.

37. (Previously presented) The method of claim 21, wherein detecting comprises identifying a location of the semiconductor device substrate from which the electromagnetic radiation was reflected.

38. (Previously presented) The method of claim 21, wherein detecting comprises identifying a location of the semiconductor device substrate to which the electromagnetic radiation was directed.

39. (Previously presented) The method of claim 21, wherein correlating comprises mapping at least each location at which the intensity of electromagnetic radiation reflected from the semiconductor device substrate varied from the baseline intensity.

40. (Previously presented) The method of claim 39, wherein correlating further comprises recognizing the identification mark based at least in part on the mapping.

41. (Previously presented) A system for identifying a marking on a substrate indicative of a type of semiconductor device being fabricated on the substrate and at least partially covered by at least one layer of material, comprising:

at least one radiation source configured and positioned to direct electromagnetic radiation of at least one wavelength toward a substrate, the at least one wavelength capable of at least partially penetrating a material opaque to visible wavelengths of electromagnetic radiation;

at least one reflectometer positioned so as to receive electromagnetic radiation of the at least one wavelength reflected from a location of the substrate covered with a material opaque to visible wavelengths of electromagnetic radiation; and

at least one processor associated with the reflectometer for analyzing a pattern of intensities of electromagnetic radiation of the at least one wavelength reflected from a plurality of locations of the substrate and for correlating the pattern of intensities to a known identifier associated with the marking and to the type of semiconductor device being fabricated on the substrate.

42. (Previously presented) The system of claim 41, wherein the at least one processor includes at least one logic circuit for comparing the intensity of the at least one wavelength of radiation reflected from the location of the substrate to a baseline intensity, the logic circuit being under control of at least a portion of at least one program.

43. (Previously presented) The system of claim 42, wherein the at least one logic circuit for comparing the intensity also effects storing in memory at least one location of the substrate where the intensity of the at least one wavelength of radiation reflected from the substrate varies from the baseline intensity.

44. (Previously presented) The system of claim 43, wherein the at least one processor includes at least one logic circuit for mapping at least locations of the substrate where an intensity of the at least one wavelength of reflected electromagnetic radiation varies from the baseline intensity, the at least one logic circuit for mapping being under control of at least a portion of at least one program.

45. (Previously presented) The system of claim 44, wherein the at least one processor includes at least one logic circuit for identifying the surface feature based on a mapped plurality of locations where an intensity of the at least one wavelength of reflected electromagnetic radiation varies from the baseline intensity, the at least one logic circuit for identifying being under control of at least a portion of at least one program.

46. (Previously presented) The system of claim 41, further comprising an actuation apparatus for effecting movement of at least one of the substrate and the at least one radiation source.

47. (Previously presented) The system of claim 41, wherein the at least one radiation source is configured to direct incident radiation of a plurality of wavelengths onto at least a portion of the substrate.

48. (Previously presented) The system of claim 47, wherein the at least one reflectometer is configured to measure intensities of reflected radiation of each of the plurality of wavelengths.

49. (Previously presented) The system of claim 41, wherein the at least one radiation source is configured to emit incident radiation of wavelengths of about 100 nm to about 1,000 nm.

50. (Previously presented) The system of claim 41, wherein the at least one radiation source is configured to emit incident radiation of wavelengths of about 190 nm to about 800 nm.

51. (Previously presented) The system of claim 41, wherein the at least one radiation source is configured to emit incident radiation of a wavelength of at least about 140 nm.

52. (Previously presented) The system of claim 41, wherein the at least one radiation source is configured to emit incident radiation of wavelengths of about 220 nm to about 800 nm.

53. (Previously presented) The system of claim 41, wherein the at least one radiation source is configured to emit incident radiation of wavelengths of about 300 nm to about 780 nm.

54. (Previously presented) The system of claim 41, wherein the at least one radiation source is configured to emit incident radiation of a wavelength of about 550 nm.

55. (Previously presented) The system of claim 41, wherein the at least one radiation source is positioned to emit incident radiation toward an active surface of the substrate.

56. (Previously presented) The system of claim 41, wherein the at least one radiation source is positioned to emit incident radiation toward an active surface of the substrate at a non-perpendicular angle thereto.

57. (Previously presented) The system of claim 41, further comprising a user interface associated with the at least one processor.

58. (Previously presented) The system of claim 41, further comprising at least one output device associated with the at least one processor.

59. (Previously presented) A processor for characterizing at least one material-covered recessed marking formed in a substrate, embedded within material opaque to visible wavelengths of radiation, for identifying a type of semiconductor device being fabricated on the substrate, comprising:

at least one logic circuit for comparing a measured intensity of at least one wavelength of reflected radiation to a baseline intensity of the at least one wavelength of radiation reflected from a planar portion of the substrate and through at least one material layer that is opaque to visible wavelengths of electromagnetic radiation; and
at least one logic circuit for mapping a plurality of locations of the substrate where the measured intensity differs from the baseline intensity, the at least one logic circuit being under control of at least a portion of at least one program, a map resulting from the mapping comprising a digital image of characters of the recessed marking; and
at least one logic circuit for identifying a type of semiconductor device that corresponds to the mapped locations.

60. (Previously presented) The processor of claim 59, further comprising:
at least one logic circuit for characterizing the at least one material-covered recess based on the plurality of locations mapped by the at least one logic circuit for mapping, the at least one logic circuit for characterizing being under control of at least a portion of at least one program.